

**WETLAND DELINEATION
FOR THE
CUMRU TOWNSHIP FIRE STATION PROJECT**

Cumru Township, Berks County,
Pennsylvania

Prepared for:

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INTRODUCTION

This report identifies "waters of the United States and Commonwealth" (see Regulatory Definitions) within the 5.29-acre study area for the Cumru Township Fire Station Project located along Church Road and Welsh Road in Cumru Township, Berks County, Pennsylvania. The study area for this investigation consists of a total of 5.29 acres in the southeastern quadrant of the intersection of Church Road and Welsh Road. Our investigations indicate that, under present scene conditions, 0.36 acres of wetlands (Wetland 1) and one (1) watercourse (UNT to the Angelica Creek) occur within the study area for the Cumru Township Fire Station Project are subject to regulations under the federal Clean Water Act, U.S. Rivers and Harbors Act of 1899, and Pennsylvania Department of Environmental Protection Chapter 105. The procedures described in the United States Army Corps of Engineers Wetland Delineation Manual (1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region – Version 2.0 (April 2012) were used to delineate the wetlands within the study area.

These findings are based on review of background information and field investigations. The background information examined included the Reading, PA 7.5-minute USGS topographic quadrangle, the Online Web Soil Survey for Berks County, PA (<http://websoilsurvey.nrcs.usda.gov/app>), aerial photographs, and the U.S. Fish and Wildlife Service National Wetland Inventory (NWI) Wetlands Online Mapper. Field investigations were conducted on February 22 and March 24, 2016 by Bradley J. Gochnauer of Vortex Environmental, Inc. This report generally characterizes the study area and identifies and discusses the three parameters (hydrology, soils, and vegetation) involved in determining the location of wetland areas.

LOCATION

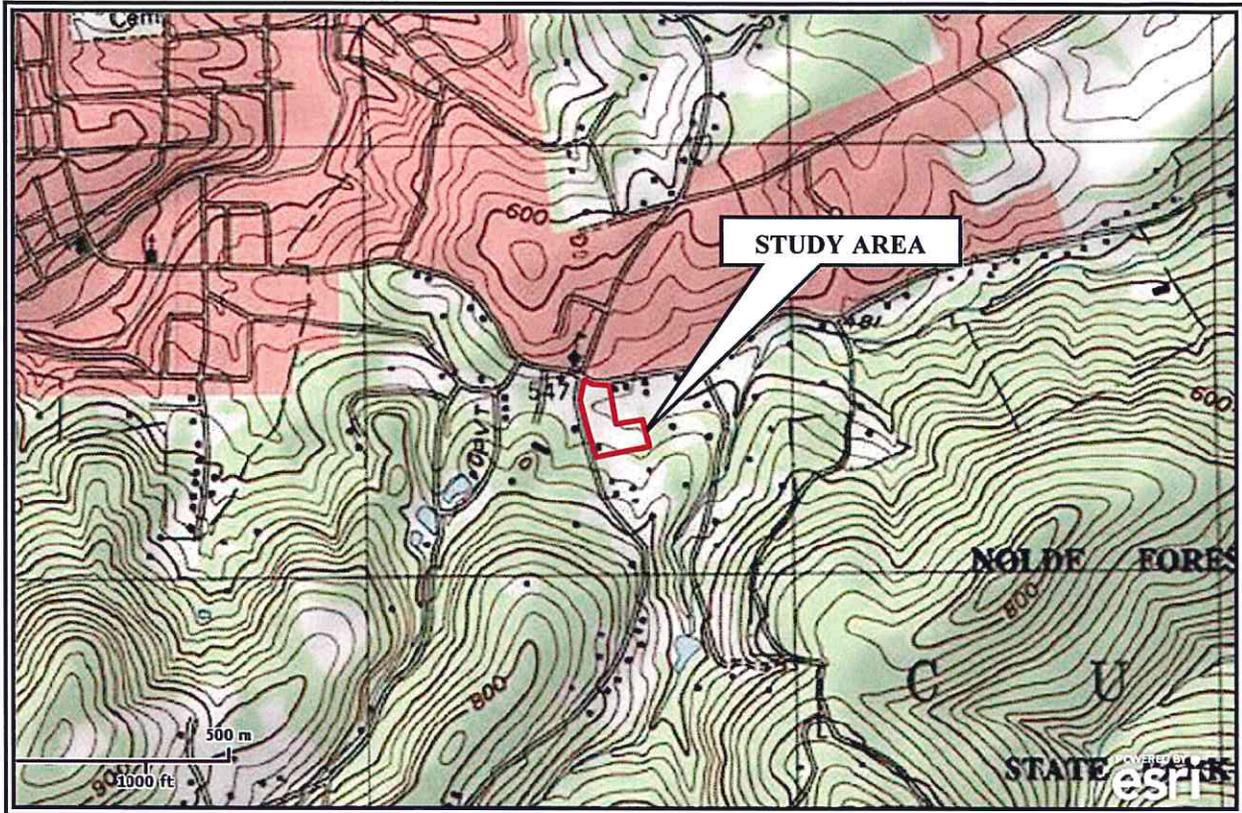
The Cumru Township Fire Station Project is located east of Welsh Road, south of its intersection with Church Road (Figure 1). The study area is bounded to the north by Church Road (Photograph A), to the south by the existing township maintenance facility, to the east by residential properties, and to the west by Welsh Road (Photographs G, H, and V). A dwelling, maintenance building, associated paved driveways and parking areas, and storm water management basin (Photographs Q, R, S, T, and U) were observed in the southern portion of the study area. The vegetation within the study area includes old field, mowed lawn, and emergent wetlands.



Legend:
 Study Area Boundary ———

NOT TO SCALE

Figure 1: Site Map for the Cumru Township Fire Station Project
 Google Maps
 Google.com
 Cumru Township, Berks County, Pennsylvania



Legend:
 Study Area Boundary —————

NOT TO SCALE

Figure 2: USGS Map for the Cumru Township Fire Station Project
 Reading, PA, 7.5 – minute USGS Topographic Quadrangle
 1956, Photo Revised 1983
 Cumru Township, Berks County, Pennsylvania

BACKGROUND INFORMATION

HYDROLOGY and TOPOGRAPHY

Hydrology within the study area is generally conveyed via overland sheet flow and existing stormwater management facilities into the unnamed tributary to the Angelica Creek (Watercourse 1). This intermittent stream channel originates at the existing storm water culvert along Welsh Road, then drains east through Wetland 1, before flowing off-site along the eastern boundary of the study area. The study area is located within the watershed of the Angelica Creek. This study area lies within the drainage basin of the Delaware River Basin and is in the regulatory jurisdiction of the Philadelphia District of the Army Corps of Engineers.

The study area is located within the Angelica Creek watershed as designated by the Pennsylvania Department of Environmental Protection (PADEP) Water Quality standards (Subpart C, Article II, Chapter 93.3 in Table 1 (93.3)). The PADEP Water Quality Standards Table indicates that the water usage of this watershed is designated as CWF, MF (Cold Water Fisheries, Migratory Fishes) water.

The Angelica Creek is also listed by the Pennsylvania Fish and Boat Commission as a stream section that supports the natural reproduction of wild trout, therefore the wetland area (Wetland 1) associated with this unnamed tributary to the Angelica Creek would receive the Exceptional Value (EV) wetland designation.

The Cumru Township Fire Station Project is comprised of gently rolling to moderately steep topography. Review of the Reading, PA USGS 7.5-minute quadrangle revealed that the existing topography on the study area ranges between 523 and 562 feet in elevation above mean sea level.

SOILS

Two soil series including three soil types; Neshaminy silt loam, NaB and NaC; and Neshaminy gravelly silt loam, NhD; occur on the Cumru Township Fire Station Project according to the Online Soil Survey for Berks County, PA (Figure 3). These soils are all listed as partially hydric according to the Hydric Soils of the United States and the "Hydric Soils of Berks County". Brief summaries of the soil types are given in Appendix D.

"A hydric soil is a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part" (USDA-SCS, 1987). Extended periods of inundation/saturation cause a chemical change in the soil which is reflected in the soil color and physical characteristics of the soil. These properties typically can be readily observed during field investigations.



Legend:
 Study Area Boundary ———

NOT TO SCALE

Figure 3: Soil Map for Cumru Township Fire Station Project
 Online Web Soil Survey of Berks County, PA
<http://websoilsurvey.nrcs.usda.gov/app>
 Cumru Township, Berks County, Pennsylvania

In most cases the soil colors are the most diagnostic feature of a hydric soil. Hydric mineral soil will either be gleyed or have a low chroma matrix and/or bright mottles. A typical gleyed soil will have blue, green, or gray coloration directly below the A-horizon. A mottled soil with a low chroma matrix is usually indicative of a fluctuating water table (Wetland Training Institute, Inc., 1989).

NATIONAL WETLAND INVENTORY (NWI)

The National Wetland Inventory (NWI) Overlay Map (U.S. Fish & Wildlife Service Wetlands Online Wetland Mapper) does not indicate the presence of any wetlands, watercourses, or open waters within the study area (Figure 4). The NWI was produced by the United States Fish and Wildlife Service Online Mapper to inventory and classify wetlands using the categories of Cowardin et. al.(1979). NWI maps were not intended to locate regulated wetlands pursuant to the Clean Water Act.

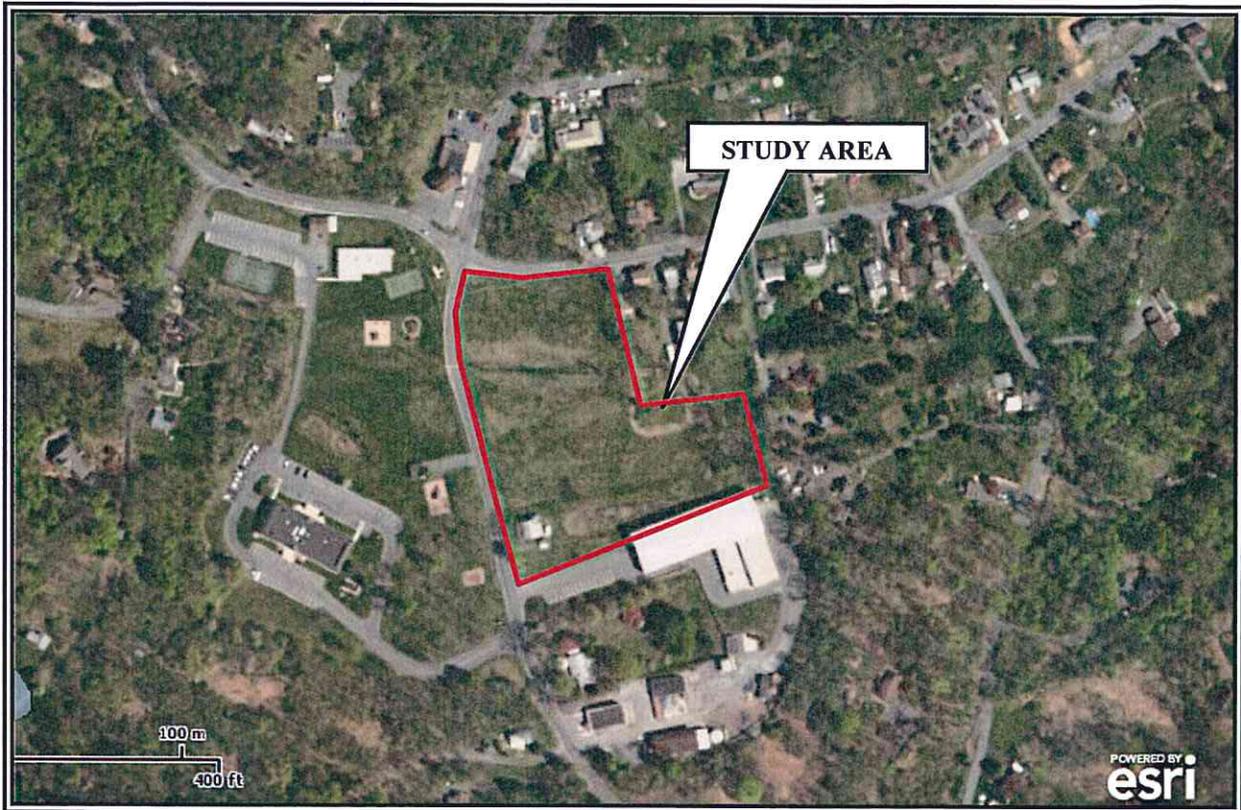
FIELD INVESTIGATIONS

METHODS

The procedures described in the United States Army Corps of Engineers Wetland Delineation Manual (1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region – Version 2.0 (April 2012) were used to delineate the wetlands within the study area. Field investigations were performed on February 22 and March 24, 2016 by Bradly J. Gochner of Vortex Environmental, Inc. A boundary survey and wetlands location plan was used as a base map during our field investigations. An initial reconnaissance-level survey was performed to analyze general study area conditions and plant community types. The hydrology, soils, and vegetation were then examined throughout the study area, at regular intervals along wetland boundaries, and in areas representative of plant communities.

Evidence of hydrologic influence was noted by identifying direct and indirect indicators. The extent of soil saturation and inundation are direct hydrologic indicators. Indirect hydrologic indicators include oxidized channels (rhizospheres) associated with living roots, water marks, drift lines, water-borne sediment deposits, surface scoured areas, water stained leaves, buttressed tree trunks, superficial roots, multiple trunks, hypertrophied lenticels, drainage patterns, and hydric soil characteristics.

Soil borings were extracted to depths of 0 to 18 inches with Dutch augers and examined for hydric field indicators. Reported depths of less than 18 inches were the result of auger refusal due to stones, roots, or water inundation within the soil boring. Descriptions of representative soils are presented in Appendix A. Descriptions of soil profiles at each sampling area were compared to the soil types shown on the county soil survey. The characteristics associated with a hydric mineral soil are usually a matrix chroma of 2 or less in mottled soils or a matrix chroma of 1 or less in unmottled soils as compared to the Munsell Soil Color Charts. Soil color determinations are made with soils that are or have been moistened. The depth of hydric soil determination is directly below the A-horizon or at approximately 10 inches, whichever is closer



Legend:
 Study Area Boundary ———

NOT TO SCALE

Figure 4: NWI Map for the Cumru Township Fire Station Project
 U.S. Fish and Wildlife Service Wetlands Online Wetland Mapper
<http://wetlandsfws.er.usgs.gov/NWI/index.html>
 Cumru Township, Berks County, Pennsylvania

(Sipple, 1988). The hydrophytic status of plant communities was determined by estimating the percent aerial cover of dominant plants within each stratum. Dominant species are those species in each stratum that, when ranked in decreasing order of abundance and cumulatively totaled, immediately exceed 50 percent of the 46 dominance measure for that stratum, plus any additional plant species comprising 20 percent or more of the 46 dominance measure for that stratum. Indicator statuses were assigned to the dominant species and the vegetation was classified as hydrophytic, non-hydrophytic, or inconclusive. Hydrophytic vegetation is present when more than 50 percent of the dominant species of the vegetation unit or sample plot have an indicator status of OBL, FACW, and/or FAC. If the vegetation is not dominated by these types of plants, the unit or plot is usually non-wetland. The vegetation was identified in the field with the aid of The Flora of West Virginia, Newcomb's Wildflower Guide, The Tree Identification Book, and The Shrub Identification Book. Scientific and common names of the flora are listed with their assigned indicator status; scientific nomenclature follows Reed (1988) and USDA-SCS (1982).

The delineated wetland boundaries were marked in the field with numbered flagging to facilitate an instrument survey of the boundaries. A wetland delineation plan (Appendix E) was prepared using an existing conditions plan as a base. The wetland boundaries shown on wetland delineation plan represent an instrument survey of the wetland flagging placed on the study area. The regulated wetlands and watercourses are identified on the attached wetland delineation plan (Appendix E).

GENERAL SITE CHARACTERISTICS

The wetland and non-wetland summaries are based on field investigations conducted on February 22 and March 24, 2016. The vegetation on the Cumru Township Fire Station Project was comprised of old field, mowed lawn, and emergent wetlands.

WETLANDS

Vortex Environmental identified one (1) wetland area within the study area for the Cumru Township Fire Station Project labeled Wetland 1, totaling 0.36 acres (on-site).

Palustrine emergent, persistent (PEM1) wetland; Total Wetland Acres = 0.36 acre

Wetland 1 – 0.36 acre

The emergent wetland area was associated with low ground slopes, seasonal high groundwater tables, poorly drained soils and the overbank flows from the adjacent intermittent stream channel (Sampling Point 1; Photographs F, I, J, K, L and M). Wetland 1 was located in the central portion of the study area adjacent to Watercourse 1 (UNT to the Angelica Creek). The vegetation within the wetland area consisted of reed canary grass, path rush, common rush and yellow nutsedge. Primary indicators of wetland hydrology observed within the sampling point included saturation in the upper 12 inches, matted vegetation and oxidized root channels in the upper 12 inches of the soil profile. Secondary indicators of wetland hydrology included wetland drainage patterns and geomorphic position. The dominant hydrophytic vegetation and

hydrologic characteristics observed within Wetland 1 are typical of wetland habitats. Flags A1-A23 and B1-B25 were used to delineate the boundaries of this wetland area.

WATERCOURSES

Vortex Environmental observed one (1) watercourse on the Cumru Township Fire Station Project.

Watercourse 1 - Riverine, intermittent, streambed, mud (R4SB5)

Watercourse 1 (UNT to Angelica Creek) originates at an existing stormwater culvert outfall along Welsh Road, then drains to the east through Wetland 1, before flowing off-site along the eastern boundary of the study area. At the time of our investigation, Watercourse 1 was approximately 3 to 4 feet wide with banks approximately six inches feet high (Photographs C, F, K and L). Side slopes of these banks ranged from 1:1 to 3:1. The substrate of the watercourse was a mud bed throughout its' length. The watercourse contained approximately ½ inch of base flow at the time of the investigation.

OPEN WATERS

Vortex Environmental, Inc. did not observe any regulated open waters on the Cumru Township Fire Station Project.

NON-WETLANDS

Vortex Environmental identified two (2) non-wetland areas within the study area for the Cumru Township Fire Station Project, including old field and mowed lawn.

Old field

The old field vegetation was observed throughout the northern and central portions of the study area and is occasionally mowed (Sampling Point 2; Photographs B, D, E, N, O, P, W and X). The old field vegetation included Orchard grass, timothy, Canada golden-rod, Canada thistle, common chickweed, common dandelion, curly dock, English plantain, field garlic, giant foxtail grass, Indian grass, Kentucky bluegrass, path rush, purple deadnettle, Queen Annes lance, red clover and multiflora rose. The lack of hydrophytic vegetation and hydrologic characteristics observed within the old field are typical of non-wetland habitats.

Mowed lawn

The mowed lawn was observed in the southern portion of the study area, adjacent to the existing buildings, driveways, and parking areas (Sampling Point 3; Photographs S and T). The mowed lawn vegetation included Kentucky bluegrass, common dandelion, field garlic, ground ivy, Indian strawberry, and white clover. The lack of hydrophytic vegetation and hydrologic characteristics observed within the mowed lawn are typical of non-wetland habitats.

CONCLUSION

The enclosed wetland delineation plan (Appendix E) indicates the extent of wetlands and watercourses within the 5.29-acre study area for the Cumru Township Fire Station Project. Our determinations were based on background and field investigations of hydrology, soils, and vegetation. We conclude that approximately 0.36-acre of wetlands (Wetland 1), and one (1) intermittent watercourse (Watercourse 1 – UNT to the Angelica Creek) occur within the study area for the Cumru Township Fire Station Project.

The wetland and watercourse locations are shown on the wetland delineation plan (Appendix E). State and federal permits should be obtained before any fill or encroachment is initiated in waters of the United States.

REGULATORY DEFINITIONS

Waters of the United States are defined by the Army Corps of Engineers (ACOE) (33 CFR 328.3) as "all waters which are subject to the ebb and flow of the tide, and also, waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds of which the use, degradation, or destruction of could affect interstate or foreign commerce".

Waters of the Commonwealth are defined by the PA Department of Environmental Protection (Chapter 105.1) as "All watercourses, streams, or bodies of water and their floodways wholly or partly within or forming part of the boundary of this Commonwealth".

Watercourses are defined by the PA Department of Environmental Protection (Chapter 105.1) as "Any channel of conveyance of surface water having defined bed and banks, whether natural or artificial, with perennial or intermittent flow".

Wetlands are defined by the Environmental Protection Agency (EPA) and ACOE (40 CFR 230.3 and 33 CFR 328.3) as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration to support and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas"

REFERENCES

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- U.S. Fish & Wildlife Service Wetlands Online Mapper. NWI Overlay Map (http://wetlands.fws.gov/mapper_tool.htm). Not to scale.
- USGS (U.S. Geological Survey). 1956, Photo Revised 1983. Reading, PA; 7.5-minute topographic USGS quadrangle. Department of Interior, Washington, DC. Not to scale.
- U.S. Rivers and Harbors Act of 1899 (Sections 9 & 10) 33 U.S.C. 403.

APPENDIX A

Table 1: Soil Characterization Chart

Table 1: Soils Characterization Chart: Descriptions of representative soil borings on the Cumru Township Fire Station Project, Cumru Township, Berks County, Pennsylvania. Matrix and mottling colors follow the Munsell color charts (Kollmorgen Corporation, 1990).

<u>SOIL LOCATION</u>	<u>DEPTH INCHES</u>	<u>MATRIX COLOR</u>	<u>MOTTLING COLOR</u>	<u>TEXTURE</u>	<u>CLASSIFICATION</u>
1	0-16	7.5YR 4/2	7.5YR 4/3 7.5YR5/8	Gravelly Silt Loam	Hydric
2	0-16	7.5YR 4/3	None	Gravelly Silt Loam	Non-hydric
3	0-16	7.5YR 4/4	None	Gravelly Silt Loam	Non-hydric

APPENDIX B

Field Data Sheets (1 - 3)

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont (DRAFT)

Project/Site: Cumru Township Fire Station Project City/County: Berks Sampling Date: 02/22/16 & 03/24/16
 Applicant/Owner: Cumru Township State: PA Sampling Point: 1
 Investigator(s): Bradly J. Gochbauer Section, Township, Range: Cumru Township
 Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave
 Slope (%): 3% Lat: 40 16' 50.6"N Long: 75 58' 11.8"W Datum: UTM
 Soil Map Unit Name: NaB NWI classification: PEM1

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)

Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No

Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Remarks: <u>Emergent wetland (Wetland 1) in the central portion of the study area, adjacent to Watercourse 1 (UNT to the Angelica Creek)</u>					

VEGETATION - Use scientific names of plants.

Tree Stratum: (Plot Size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
2. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
3. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
4. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
5. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
6. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
7. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
8. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
9. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
<u> </u> = Total Cover				
Sapling/Shrub Stratum: (Plot Size: <u>15'</u>)		Dominant Species?	Indicator Status	
1. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
2. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
3. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
4. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
5. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
6. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
7. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
8. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
9. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
<u> </u> = Total Cover				
Herb Stratum: (Plot Size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Phalaris arundinacea (Reed Canary Grass)</u>	<u>75</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
2. <u>Juncus tenuis (Path Rush)</u>	<u>5</u>	<input type="checkbox"/>	<u>FAC</u>	
3. <u>Juncus effuses (Common Rush)</u>	<u>15</u>	<input type="checkbox"/>	<u>FACW</u>	
4. <u>Cyperus esculentus (Yellow Nutsedge)</u>	<u>5</u>	<input type="checkbox"/>	<u>FACW</u>	
5. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
6. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
7. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
8. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
9. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
<u>100</u> = Total Cover				
Woody Vine Stratum: (Plot Size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
2. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>	
<u> </u> = Total Cover				

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of: Multiply by:

OBL species x1=

FACW species x2=

FAC species x3=

FACU species x4=

UPL species x5=

Totals: (A) (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

Rapid Test for Hydrophytic Vegetation

Dominance Test is > 50%

Prevalence Index is 3.0¹

Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks:

SOIL

Sampling Point : 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type *	Loc**		
0-16	7.5YR 4/2	65	7.5YR 4/3	30	RM	M	Silt Loam	
			7.5YR 5/8	5	D	PL		

*1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.
 **Location: PL=Pore Lining, M=Matrix.

- | | | |
|--|---|--|
| <p>Hydric Soil Indicators:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Black Histic <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) (LRR N) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MRLA 147, 148) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) | <ul style="list-style-type: none"> <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Polyvalue Below Surface (S8)(MRLA 147, 148) <input type="checkbox"/> Thin Dark Surface (S9)(MRLA 147, 148) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Iron-Manganese Masses (F12)(LRR N, MLRA 136) <input type="checkbox"/> Umbric Surface (F13) (MRLA 136, 122) <input type="checkbox"/> Piedmont Floodplain Soils (F19)(MLRA 148) | <p>Indicators for Problematic Soils: ***</p> <ul style="list-style-type: none"> <input type="checkbox"/> 2cm Muck (A10) (MLRA147) <input type="checkbox"/> Piedmont Floodplain Soils(F19)(MLRA 136, 147) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks) <p>*** Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed and problematic.</p> |
|--|---|--|

Restrictive Layer (if observed):

Type:
Depth:

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Water-Stained Leaves (B13)
- Aquatic Fauna (B13)

- True Aquatic Plants (B14)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres or Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two Required)

- Surface Soil Cracks (B6)
- Sparsely Vegetated Concave Surface (B8)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): _____
 Saturation Present? Yes No Depth (inches): 2"

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Emergent wetland (Wetland 1)

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont (DRAFT)

Project/Site: Cumru Township Fire Station Project City/County: Berks Sampling Date: 02/22/16 & 03/24/16
 Applicant/Owner: Cumru Township State: PA Sampling Point: 2
 Investigator(s): Bradly J. Gochnauer Section, Township, Range: Cumru Township
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none
 Slope (%): 4% Lat: 40 16' 49.7"N Long: 75 58' 11.9"W Datum: UTM
 Soil Map Unit Name: NaC NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes No

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			
Remarks: <u>Old field in the central portion of the study area</u>					

VEGETATION - Use scientific names of plants.

Tree Stratum: (Plot Size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
2. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
3. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
4. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
5. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
6. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
7. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
8. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
9. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
_____ = Total Cover					
Sapling/Shrub Stratum: (Plot Size: <u>15'</u>)		Dominant Species?	Indicator Status		
1. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
2. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
3. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
4. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
5. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
6. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
7. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
8. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
9. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
_____ = Total Cover					
Herb Stratum: (Plot Size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Plantago Lanceolata (English Plantain)</u>	<u>5</u>	<input type="checkbox"/>	<u>UPL</u>		
2. <u>Allium vineale (Field Garlic)</u>	<u>5</u>	<input type="checkbox"/>	<u>FACU</u>		
3. <u>Poa pratensis (Kentucky Bluegrass)</u>	<u>15</u>	<input type="checkbox"/>	<u>FACU</u>		
4. <u>Dactylis glomerata (Orchard Grass)</u>	<u>55</u>	<input checked="" type="checkbox"/>	<u>FACU</u>		
5. <u>Juncus tenuis (Path Rush)</u>	<u>5</u>	<input type="checkbox"/>	<u>FAC</u>		
6. <u>Trifolium pratense (Red Clover)</u>	<u>15</u>	<input type="checkbox"/>	<u>FACU</u>		
7. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
8. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
9. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
<u>100</u> = Total Cover					
Woody Vine Stratum: (Plot Size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
2. <u> </u>	_____	<input type="checkbox"/>	<u> </u>		
_____ = Total Cover					

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of: Multiply by:

OBL species _____ x1= _____

FACW species _____ x2= _____

FAC species _____ x3= _____

FACU species _____ x4= _____

UPL species _____ x5= _____

Totals: (A) _____ (B) _____

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

Rapid Test for Hydrophytic Vegetation

Dominance Test is > 50%

Prevalence Index is 3.0¹

Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks:

SOIL

Sampling Point : 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type *	Loc**		
0-16	7.5YR 4/3	100					Silt Loam	

*1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.
 **Location: PL=Pore Lining, M=Matrix.

- | | | |
|--|--|--|
| <p>Hydric Soil Indicators:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Black Histic <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) (LRR N) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MRLA 147, 148) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) | <ul style="list-style-type: none"> <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Polyvalue Below Surface (S8)(MRLA 147, 148) <input type="checkbox"/> Thin Dark Surface (S9)(MRLA 147, 148) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Iron-Manganese Masses (F12)(LRR N, MLRA 136) <input type="checkbox"/> Umbric Surface (F13) (MRLA 136, 122) <input type="checkbox"/> Piedmont Floodplain Soils (F19)(MLRA 148) | <p>Indicators for Problematic Soils: ***</p> <ul style="list-style-type: none"> <input type="checkbox"/> 2cm Muck (A10) (MLRA147) <input type="checkbox"/> Piedmont Floodplain Soils(F19)(MLRA 136, 147) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks) <p>*** Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed and problematic.</p> |
|--|--|--|

Restrictive Layer (if observed):
 Type: _____ Hydric Soil Present? Yes No
 Depth: _____

Remarks: _____

HYDROLOGY

- | | | |
|---|---|--|
| <p>Wetland Hydrology Indicators:</p> <p>Primary Indicators (minimum of one is required; check all that apply)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B13) <input type="checkbox"/> Aquatic Fauna (B13) | <ul style="list-style-type: none"> <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres or Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks) | <p>Secondary Indicators (minimum of two Required)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) |
|---|---|--|

Field Observations:

Surface Water Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Water Table Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? (Includes capillary fringe)	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches): _____	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Old field

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont (DRAFT)

Project/Site: Cumru Township Fire Station Project City/County: Berks Sampling Date: 02/22/16 & 03/24/16
 Applicant/Owner: Cumru Township State: PA Sampling Point: 3
 Investigator(s): Bradly J. Gochner Section, Township, Range: Cumru Township
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none
 Slope (%): 4% Lat: 40 16' 47.5"N Long: 75 58' 11.2"W Datum: UTM
 Soil Map Unit Name: NaC NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			
Remarks: <u>Mowed lawn in the southern portion of the study area</u>					

VEGETATION - Use scientific names of plants.

Tree Stratum: (Plot Size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
2. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
3. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
4. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
5. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
6. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
7. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
8. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
9. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
	<u> </u> = Total Cover		
Sapling/Shrub Stratum: (Plot Size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
2. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
3. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
4. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
5. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
6. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
7. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
8. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
9. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
	<u> </u> = Total Cover		
Herb Stratum: (Plot Size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Taraxacum officinale (Dandelion)</u>	<u>5</u>	<input type="checkbox"/>	<u>FACU</u>
2. <u>Allium vineale (Field Garlic)</u>	<u>5</u>	<input type="checkbox"/>	<u>FACU</u>
3. <u>Glechoma hederacea (Ground Ivy)</u>	<u>5</u>	<input type="checkbox"/>	<u>FACU</u>
4. <u>Duchesnea indica (Indian Strawberry)</u>	<u>5</u>	<input type="checkbox"/>	<u>FACU</u>
5. <u>Poa pratensis (Kentucky Bluegrass)</u>	<u>65</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
6. <u>Trifolium repens (White Clover)</u>	<u>15</u>	<input type="checkbox"/>	<u>FACU</u>
7. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
8. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
9. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
	<u>100</u> = Total Cover		
Woody Vine Stratum: (Plot Size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
2. <u> </u>	<u> </u>	<input type="checkbox"/>	<u> </u>
	<u> </u> = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of: Multiply by:

OBL species x1=

FACW species x2=

FAC species x3=

FACU species x4=

UPL species x5=

Totals: (A) (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

Rapid Test for Hydrophytic Vegetation

Dominance Test is > 50%

Prevalence Index is 3.0¹ Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks:

SOIL

Sampling Point : 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type *	Loc**		
0-16	7.5YR 4/4	100					Gravelly Silt Loam	

*1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.
 **Location: PL=Pore Lining, M=Matrix.

<p>Hydric Soil Indicators:</p> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Black Histic <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) (LRR N) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MRLA 147, 148) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Polyvalue Below Surface (S8)(MRLA 147, 148) <input type="checkbox"/> Thin Dark Surface (S9)(MRLA 147, 148) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Iron-Manganese Masses (F12)(LRR N, MLRA 136) <input type="checkbox"/> Umbric Surface (F13) (MRLA 136, 122) <input type="checkbox"/> Piedmont Floodplain Soils (F19)(MLRA 148)	<p>Indicators for Problematic Soils: ***</p> <input type="checkbox"/> 2cm Muck (A10) (MLRA147) <input type="checkbox"/> Piedmont Floodplain Soils(F19)(MLRA 136, 147) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
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*** Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed and problematic.

Restrictive Layer (if observed):
 Type: _____
 Depth: _____
 Remarks: _____

Hydric Soil Present? Yes No

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators (minimum of one is required; check all that apply)</p> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B13) <input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres or Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<p>Secondary Indicators (minimum of two Required)</p> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
<p>Field Observations:</p> Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (Includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: Mowed lawn.		

APPENDIX C

Site Photographs (A - X)
Photographs Taken on March 24, 2016



Photo A. Western view of the road frontage along Church Road, which forms the northern boundary of the study area.



Photo B. Southern view of the old field in the northeastern portion of the study area.



Photo C. Eastern view of Watercourse 1, where it drains off-site along the eastern boundary of the study area.



Photo D. Southern view of the old field in the central portion of the study area.



Photo E. Southwestern view of the old field in the central portion of the study area.



Photo F. Eastern view of Watercourse 1 and the associated wetland area (Wetland 1) from Welsh Road.



Photo G. Southern view of the road frontage along Welsh Road, which forms the western boundary of the study area.



Photo H. Northern view of the road frontage along Welsh Road.



Photo I. Southern view of Wetland 1 in the central portion of the study area.



Photo J. Southeastern view of Wetland 1 in the central portion of the study area.



Photo K. Eastern view of Watercourse 1 and Wetland 1 in the central portion of the study area.



Photo L. Western view of Watercourse 1 and Wetland 1 in the central portion of the study area.



Photo M. Northeastern view of Wetland 1 in the central portion of the study area.



Photo N. Southern view of the old field in the central portion of the study area.



Photo O. Southeastern view of the old field in the central portion of the study area.



Photo P. Eastern view of the old field in the eastern portion of the study area.



Photo Q. Northern view of the existing rip-rap storm water outfall swale along the eastern boundary of the study area.



Photo R. Western view of the existing storm water management basin in the southern portion of the study area, adjacent to the existing maintenance building.



Photo S. Eastern view of the existing maintenance building and associated macadam parking area in the southern portion of the study area.



Photo T. Northeastern view of the existing dwelling and macadam driveway in the southwestern portion of the study area.



Photo U. Eastern view of the existing storm water management basin in the southern portion of the study area, adjacent to the existing maintenance building.



Photo V. Northern view of the road frontage along Welsh Road, which forms the western boundary of the study area.



Photo W. Eastern view of the old field in the central portion of the study area.



Photo X. Southern view of the old field in the northern and central portions of the study area.

APPENDIX D

Soil Descriptions from the Online Soil Survey for Berks County, Pennsylvania

Map Unit: NaB—Neshaminy silt loam, 3 to 8 percent slopes

Component: Neshaminy (97%)

The Neshaminy component makes up 97 percent of the map unit. Slopes are 3 to 8 percent. This component is on hillslopes, uplands. The parent material consists of residuum weathered from diabase. Depth to a root restrictive layer, bedrock, lithic, is 48 to 80 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

Component: Towhee (3%)

Generated brief soil descriptions are created for major soil components. The Towhee soil is a minor component.

Map Unit: NaC—Neshaminy silt loam, 8 to 15 percent slopes

Component: Neshaminy (95%)

The Neshaminy component makes up 95 percent of the map unit. Slopes are 8 to 15 percent. This component is on uplands, hillslopes. The parent material consists of residuum weathered from diabase. Depth to a root restrictive layer, bedrock, lithic, is 48 to 80 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.

Component: Towhee (5%)

Generated brief soil descriptions are created for major soil components. The Towhee soil is a minor component.

Map Unit: NhD—Neshaminy gravelly silt loam, 8 to 25 percent slopes, extremely bouldery

Component: Neshaminy, extremely bouldery (97%)

The Neshaminy, extremely bouldery component makes up 97 percent of the map unit. Slopes are 8 to 25 percent. This component is on hillslopes, uplands. The parent material consists of residuum weathered from diabase. Depth to a root restrictive layer, bedrock, lithic, is 48 to 80 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72

inches. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria.

Component: Towhee, extremely stony (3%)

Generated brief soil descriptions are created for major soil components. The Towhee soil is a minor component.

APPENDIX E

Wetland Delineation Plan prepared at a scale of 1" = 40'